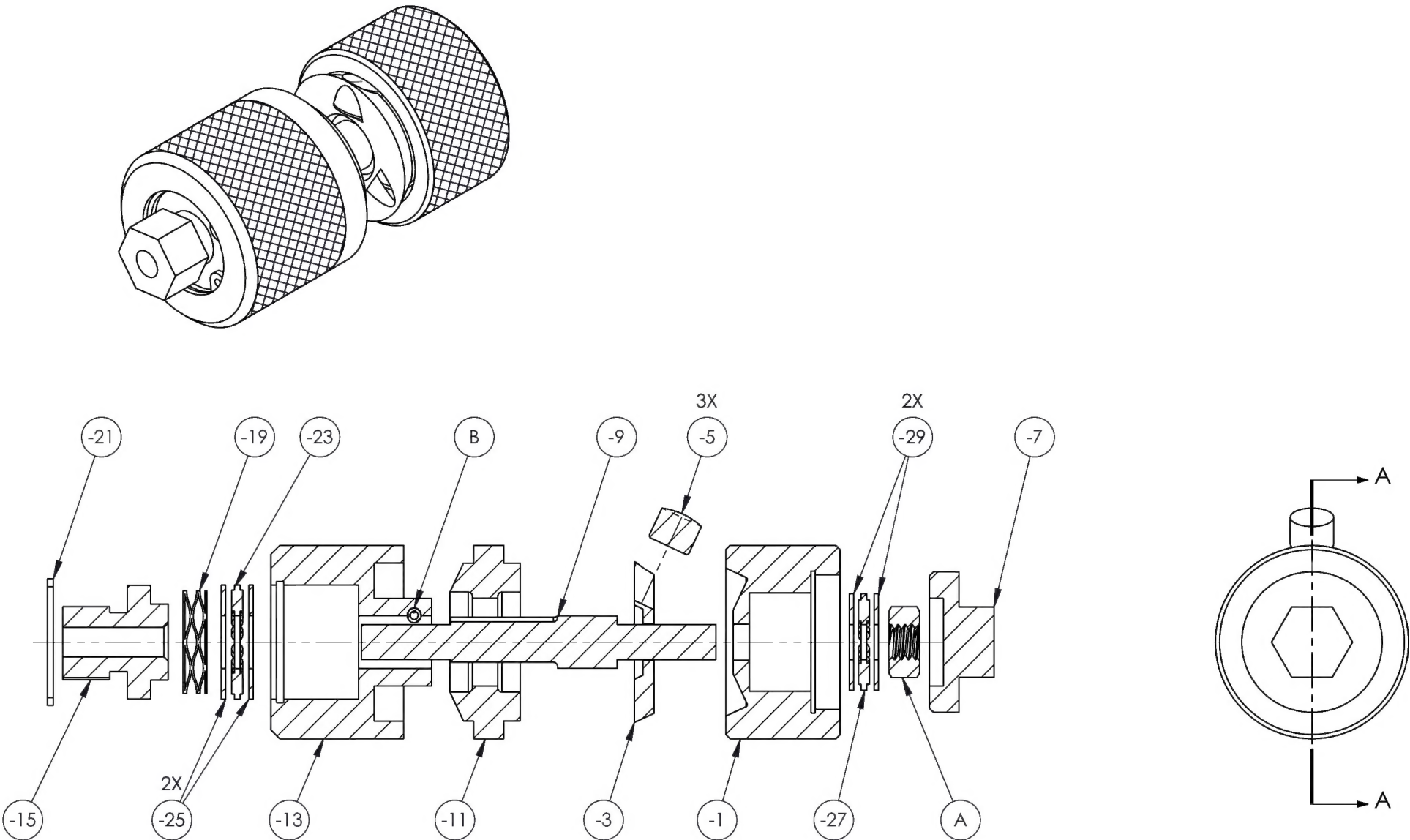


This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	JAG

BEARINGS AND TOOLS COVERED			
BEARING NUMBER	TOOL NUMBER	A	B
MS14101-3	RBST3000P	-33	-35
MS14103-3	RBST3001P	-17	-35
MS14103-4	RBST3002P	-17	-35
ADW4V			-35
11HWG04			-35
MS14101-4	RBST3003P	-17	-35
MS14103-5	RBST3004P	-17	-35
MS14101-5	RBST3005P	-17	-35
MS14101-6	RBST3006P	-17	-31
MS14103-6			-31
MS14101-7	RBST3007P	-17	-31
MS14103-7A			-31
MS14103-7	RBST3008P	-17	-31
MS14101-8	RBST3009P	-17	-31
MS14103-8	RBST3010P	-17	-31
MS14101-9	RBST3011P	-17	-31
MS14103-9	RBST3012P	-17	-31
MS14101-10	RBST3013P	-17	-31
MS14103-10	RBST3014P	-17	-31
MS14103-12	RBST3015P	-17	-31
MS14101-12	RBST3016P	-17	-31
MS14101-14	RBST3017P	-17	-31
MS14103-14	RBST3018P	-17	-31
MS14101-16	RBST3019P	-17	-31
MS14103-16	RBST3020P	-17	-31



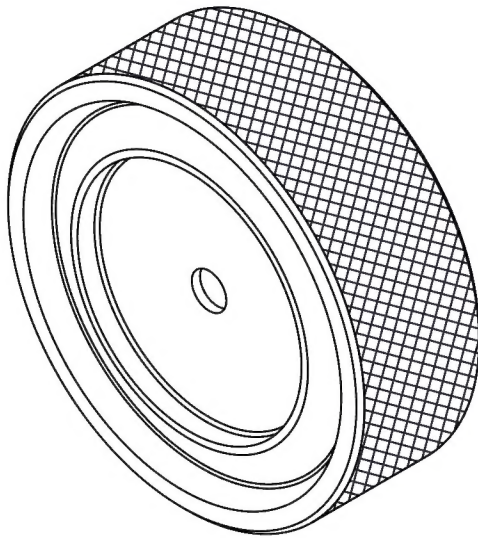
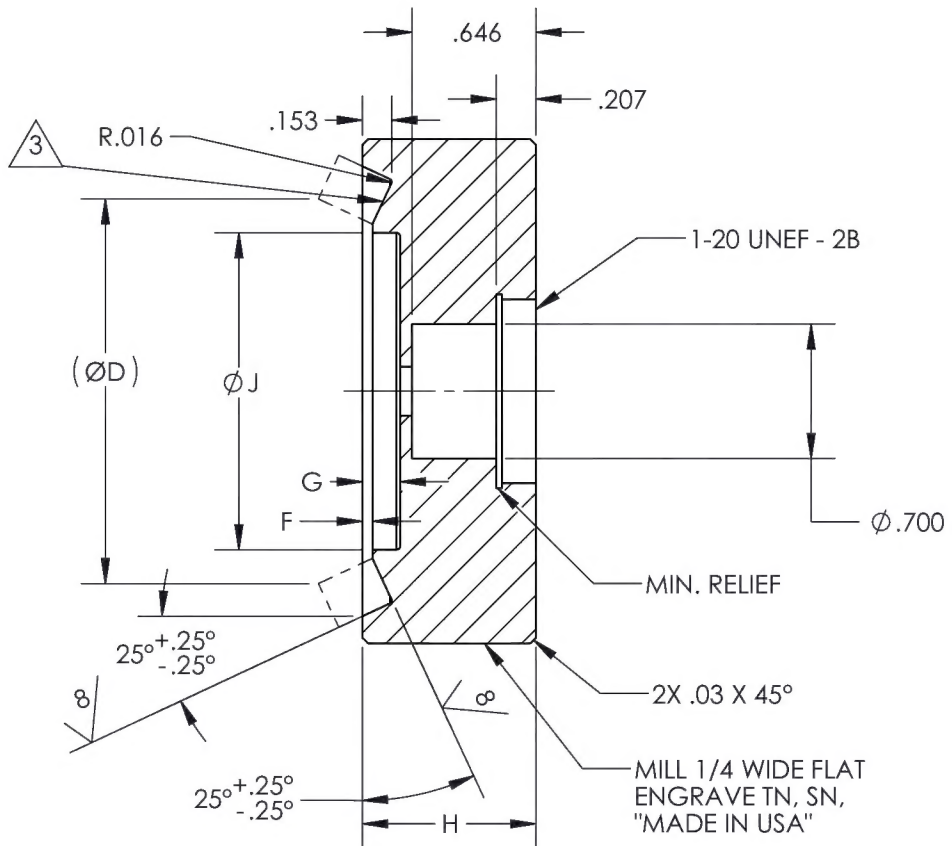
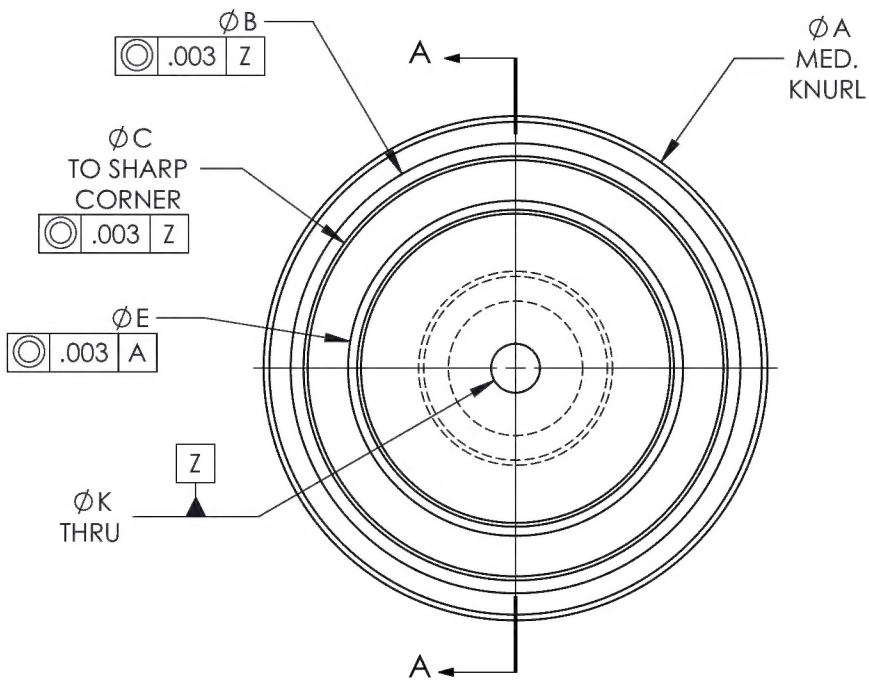
SECTION A-A

ASSY QTY	ASSY QTY	B/O	Part #	UNIT QTY	Description	Material	B/O INFORMATION OR SPECIFICATIONS	PG.
			-1	1	BASE	O1		2
			-3	1	RETAINER	BRONZE		3
			-5	3	ROLLER	STEEL	.310 MINUS GAUGE PIN MSC# 89031009 (MODIFIED)	4
			-7	1	CAP	1018		5
			-9	1	STUD	4140 Q&T/4142 Q&T		6
			-11	1	DUAL SEAT	4140 Q&T/4142 Q&T		7
			-13	1	RECEIVER	4140 Q&T/4142 Q&T		8
			-15	1	TESIONER	4140 Q&T/4142 Q&T		9
		B/O	-17	1	DISTORTED THREAD LOCK NUT	STEEL	1/4-20 UNC X 7/32 HT (MCMaster-CARR# 95056A150)	
		B/O	-19	1	CREST TO CREST WAVE SPRING	STEEL	SMALLEY RING CO. # CS075-H1	
		B/O	-21	1	SNAP RING	STEEL	Ø7/8 BORE (MCMaster-CARR# 99142A410)	
		B/O	-23	1	THRUST BEARING (SPRING SIDE)	STEEL	Ø3/8 ID X 13/16 OD X 5/64 WIDTH APPLIED(TIMKEN #NTA-613)	
		B/O	-25	2	BEARING WASHER	STEEL	Ø3/8 DI X 13/16 OD X 1/32 WIDTH APPLIED(TIMKEN# TRA-613)	
		B/O	-27	1	THRUST BEARING (SPRING SIDE)	STEEL	Ø1/4 ID X 11/16 OD X 5/64 WIDTH APPLIED(TIMKEN #NTA-411)	
		B/O	-29	2	BEARING WASHER	STEEL	Ø1/4 DI X 11/16 OD X 1/32 WIDTH APPLIED(TIMKEN# TRA-411)	
		B/O	-31	1	ROLL PIN	S.S.	Ø3/32 X 3/8 (MCMaster-CARR# 92373A141)	
		B/O	-33	1	DISTORTED THREAD LOCK NUT	STEEL	#10-24 (MCMaster-CARR# 91837A014)	
		B/O	-35	1	ROLL PIN	S.S.	Ø1/16 X 3/8 (MCMaster-CARR # 92373A107)	

DART AEROSPACE			
TITLE		RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO.		SEE TABLE	
REV		8	
MAT'L		DRAWN BY:	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		APPROVED	
.XXX ± .005		TREAT	
.XX ± .01		FINISH	
.X ± .1		SPEC	
1. BREAK ALL SHARP EDGES .015 x 45°		USED ON MODEL	
OR .015R		SEE TABLE	
2. DIMENSIONAL LIMITS APPLY AFTER PLATING		DATE	
SCALE 1:1		SHEET 1 OF 9	

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	JAG



TOOL NUMBER	ØA +.020 -.020	ØB +.006 -.002	ØC +.006 -.002	ØD P.D. REF.	ØE +.006 -.002	F +.003 -.003	G +.003 -.003	H	ØJ	ØK +.000 -.003
RBST3000P	1.250	.993	.846	.500	.276	.022	.000	.813	N/A	.195
RBST3001P	1.250	1.056	.909	.563	.339					.255
RBST3002P	1.250	1.056	.909	.563	.339					
RBST3003P	1.250	1.087	.940	.594	.370					
RBST3004P	1.250	1.118	.971	.625	.401					
RBST3005P	1.250	1.153	1.006	.660	.436					
RBST3006P	1.375	1.052	.906	.712	.460					
RBST3007P	1.375	1.146	1.000	.806	.554					
RBST3008P	1.375	1.177	1.031	.837	.585					
RBST3009P	1.375	1.216	1.070	.876	.624					
RBST3010P	1.375	1.240	1.094	.900	.648					
RBST3011P	1.500	1.310	1.164	.970	.718					
RBST3012P	1.625	1.365	1.219	1.025	.773					
RBST3013P	1.625	1.403	1.257	1.063	.811					
RBST3014P	1.625	1.427	1.281	1.087	.835					
RBST3015P	1.750	1.591	1.445	1.251	.999					
RBST3016P	1.875	1.652	1.506	1.313	1.060					
RBST3017P	2.000	1.778	1.632	1.438	1.186					
RBST3018P	2.125	1.841	1.695	1.501	1.249					
RBST3019P	2.250	1.966	1.820	1.626	1.374					
RBST3020P	2.625	2.341	2.195	2.001	1.749	.197	.904	1.650		

SECTION A-A

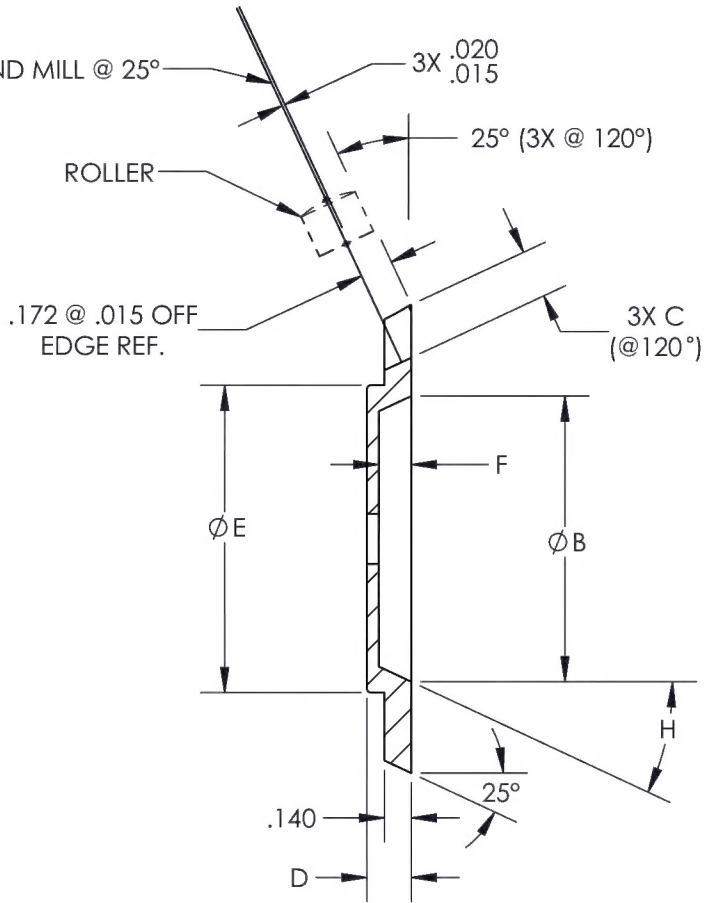
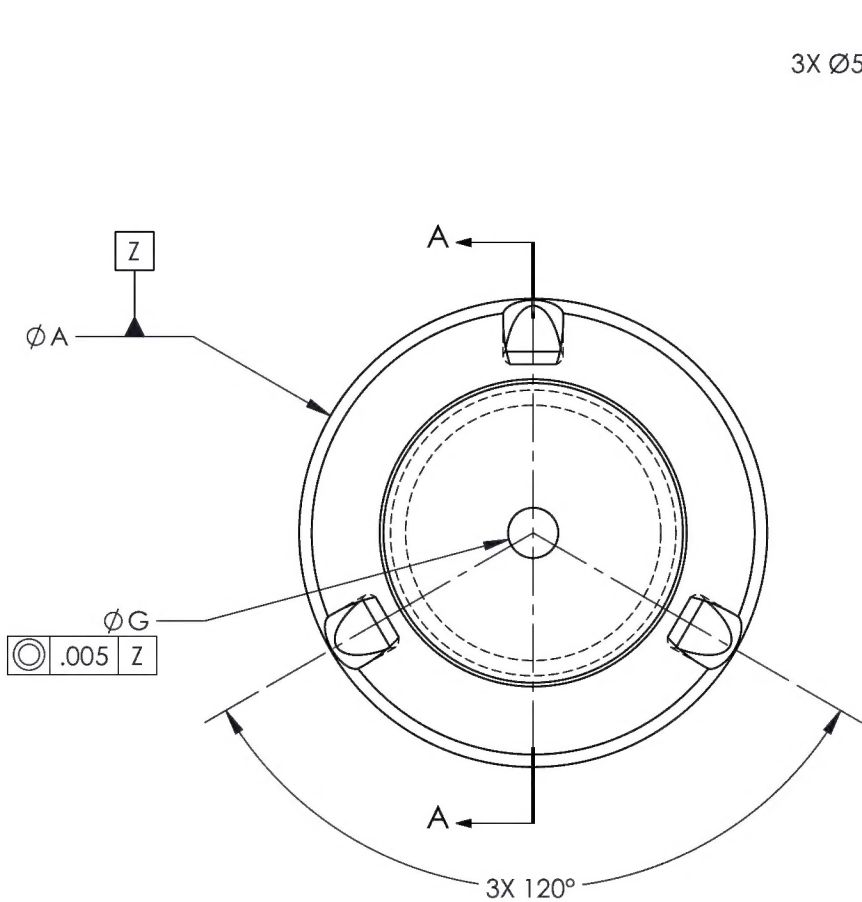
(-1)
BASE

- NOTES:
- BREAK ALL SHARP CORNERS (.015/.03).
 - DIMENSION TO BOTTOM OF R.016=.153;
DIMENSION TO SHARP CORNER=.158.
 - RACE SURFACE MUST BE SMOOTH
AND FREE OF GROOVES AND
MACHINING MARKS.
 - MUST HOLD ØC POSITION AND ANGLE
TOLERANCES TO MAINTAIN PITCH DIA.
 - DO FIRST ARTICL INSPECTION BEFORE
HEAT TREATING.

DART AEROSPACE	
TITLE RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO. SEE TABLE-1	REV 8
MAT'L 01	DRAWN BY:
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVED <i>J. Gilbert</i>
.XXX ± .005 FRACTIONS ± 1/8	HEAT TREAT RC 55-60
.XX ± .01 ANGLES ± 5°	FINISH BLACK OXIDE
.X ± .1	SPEC
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	USED ON MODEL
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	SEE TABLE
SCALE 1:1	DATE
SHEET 2 OF 9	

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	JAG

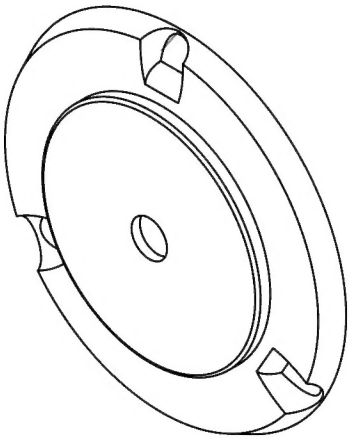


SECTION A-A

TOOL NUMBER	ØA +.002 -.002	ØB +.010 -.000	C +.003 -.003	D	ØE	F	ØG +.000 -.003	H					
RBST3000P	1.083	.260	.343	N/A	N/A	.050	.197	0°					
RBST3001P	1.147	.330					.269						
RBST3002P	1.147	.330											
RBST3003P	1.177	.330											
RBST3004P	1.207	.350											
RBST3005P	1.243	.350				.062	.262	25°					
RBST3006P	1.144	.528	.250										
RBST3007P	1.243	.711											
RBST3008P	1.274	.711											
RBST3009P	1.313	.745											
RBST3010P	1.337	.745											
RBST3011P	1.401	.792	.242										
RBST3012P	1.462	.792	.250			.075							
RBST3013P	1.500	.873											
RBST3014P	1.524	.873											
RBST3015	1.688	1.010											
RBST3016P	1.747	1.028											
RBST3017P	1.875	1.123	N/A	N/A	.070								
RBST3018P	1.938	1.123											
RBST3019P	2.063	1.246											
RBST3020P	2.438	1.487											

(-3)

RETAINER

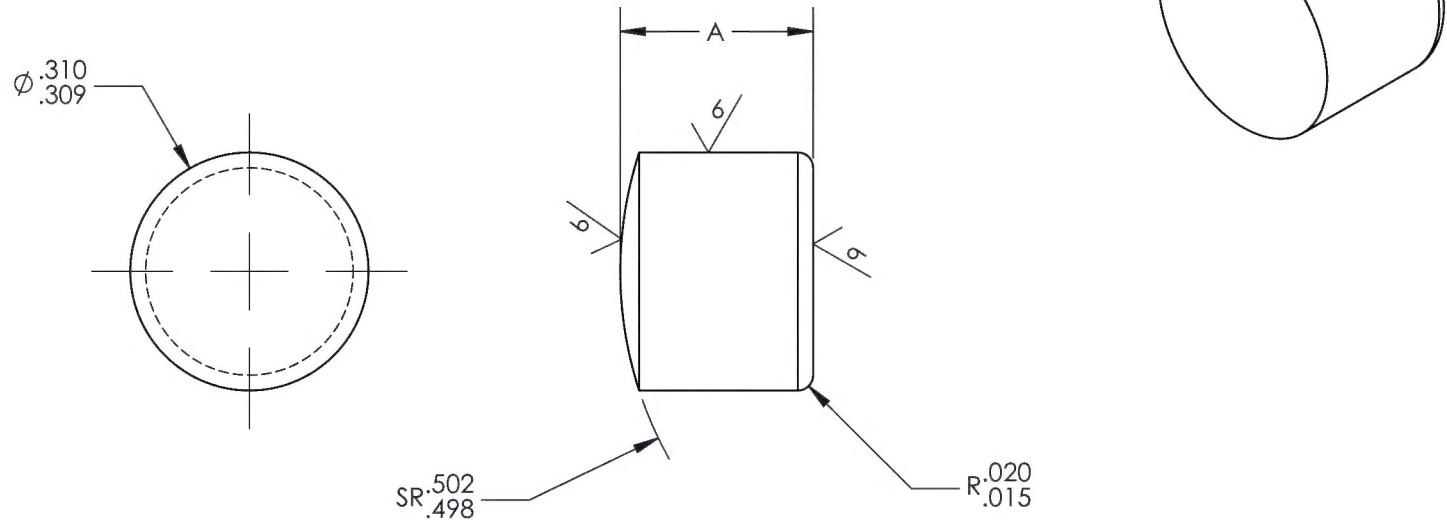


NOTES:
1. BREAK ALL SHARP CORNERS (.015/.03)

DART AEROSPACE			
TITLE		RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO.		SEE TABLE-3	REV 8
MAT'L BRONZE		DRAWN BY: APPROVED J. Gilbert	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		HEAT TREAT FINISH	
.XXX ± .005		FRACTIONS ± 1/8	
.XX ± .01		ANGLES ± 5°	
.X ± .1		SPEC	
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R		USED ON MODEL	
2. DIMENSIONAL LIMITS APPLY AFTER PLATING		SEE TABLE	
SCALE	1:1	DATE	SHEET 3 OF 9

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	JAG



(-5)
ROLLER

TOOL NUMBER	A
RBST3000P	.335
RBST3001P	
RBST3002P	
RBST3003P	
RBST3004P	
RBST3005P	.251
RBST3006P	
RBST3007P	
RBST3008P	
RBST3009P	
RBST3010P	
RBST3011P	
RBST3012P	
RSBT3013P	
RBST3014P	
RBST3015P	
RBST3016P	
RBST3017P	
RBST3018P	
RBST3019P	
RBST3020P	

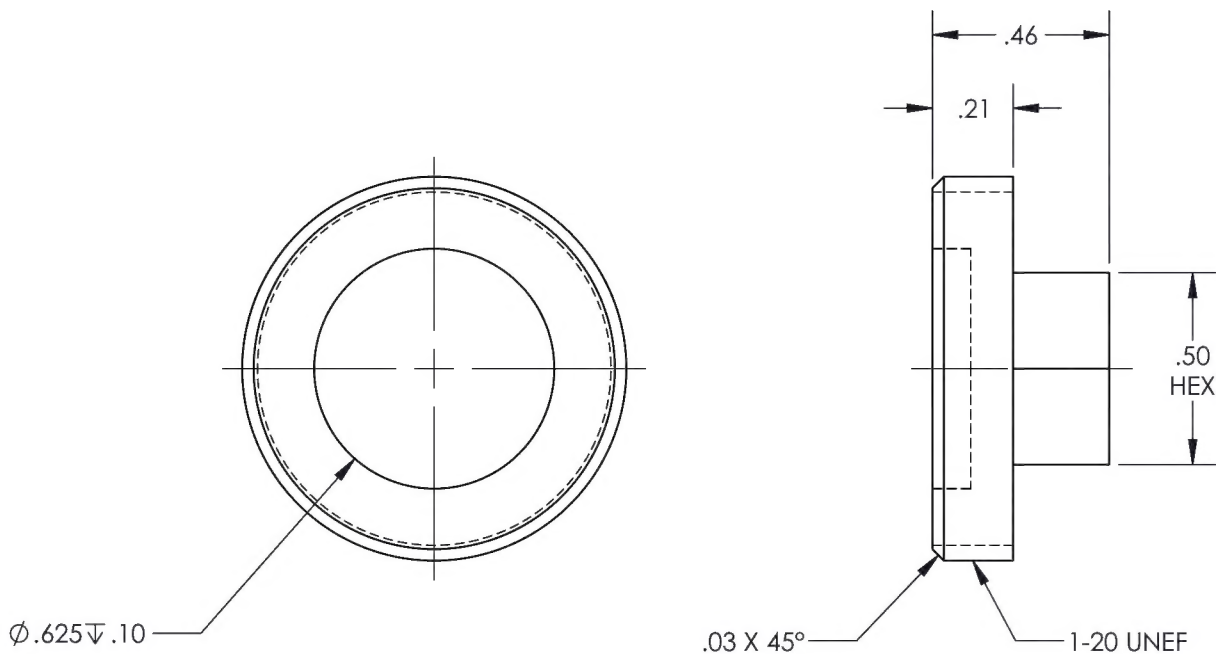
DART AEROSPACE	
TITLE RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO.	SEE TABLE-5
MAT'L STEEL	REV 8
DRAWN BY:	
APPROVED <i>J. Gilbert</i>	
HEAT TREAT RC 55-60	
FINISH	
SPEC	
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	
SCALE 4:1	DATE
SHEET 4 OF 9	

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	JAG

TOOL NUMBER

RBST3000P
RBST3001P
RBST3002P
RBST3003P
RBST3004P
RBST3005P
RBST3006P
RBST3007P
RBST3008P
RBST3009P
RBST3010P
RBST3011P
RBST3012P
RBST3013P
RBST3014P
RBST3015P
RBST3016P
RBST3017P
RBST3018P
RBST3019P
RBST3020P

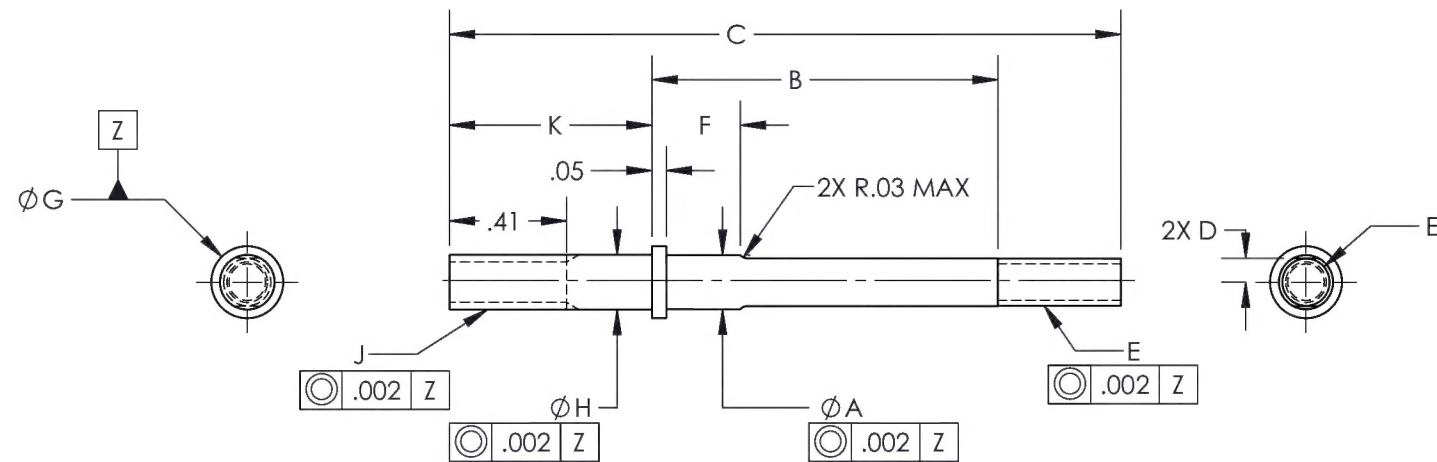


(-7)
CAP

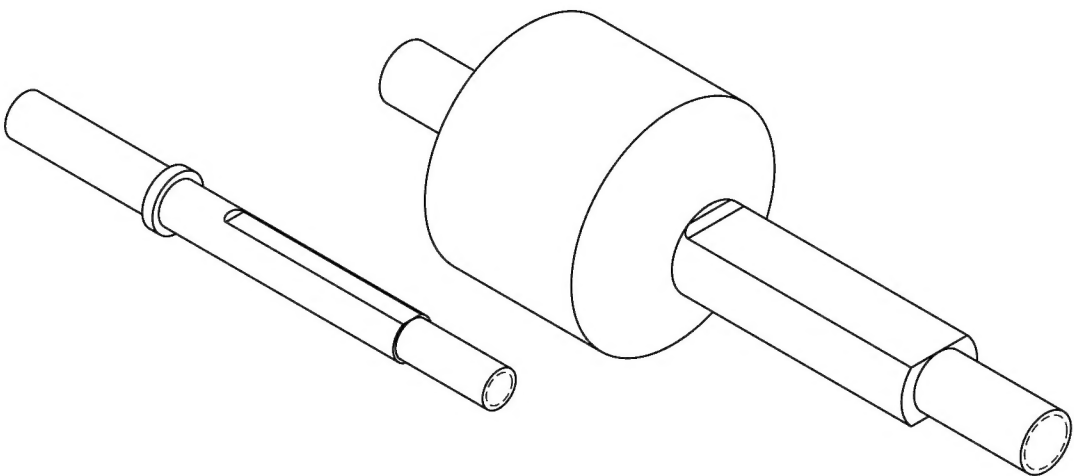
DART AEROSPACE	
TITLE RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO.	SEE TABLE-7
MAT'L 1018	REV 8
DRAWN BY:	
APPROVED <i>P Walbrich</i>	
HEAT TREAT	
FINISH BLACK OXIDE	
SPEC	
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	
USED ON MODEL	
SEE TABLE	
SCALE 2:1	DATE
SHEET 5 OF 9	

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

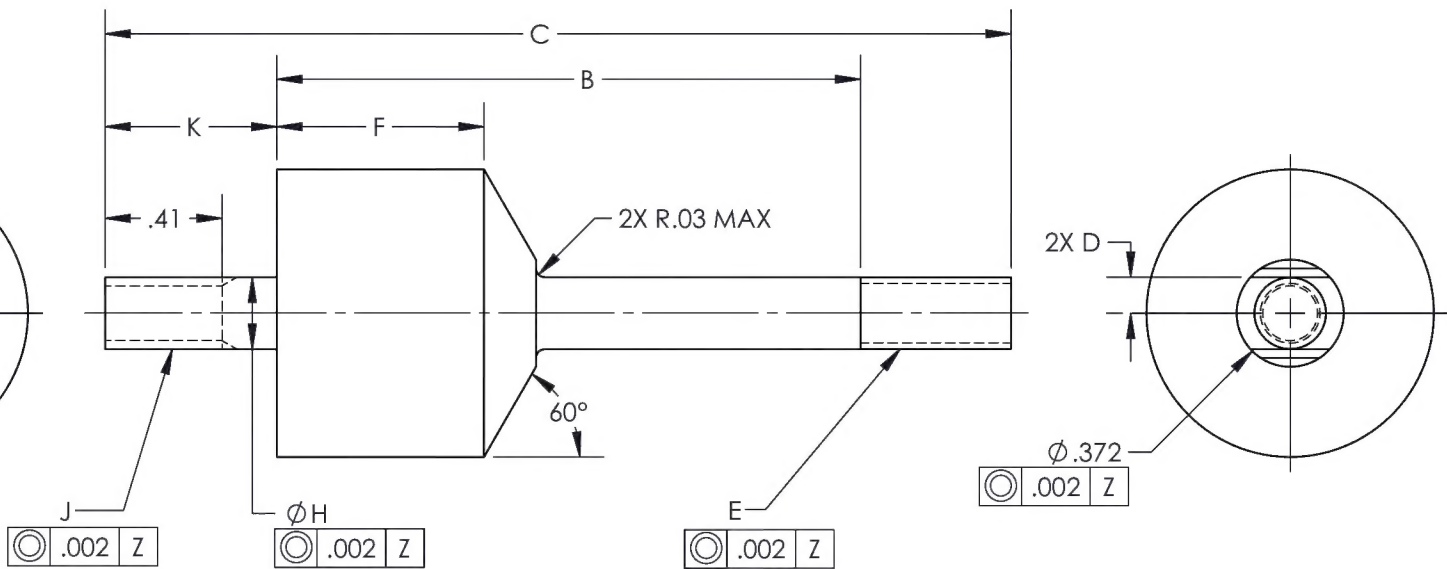
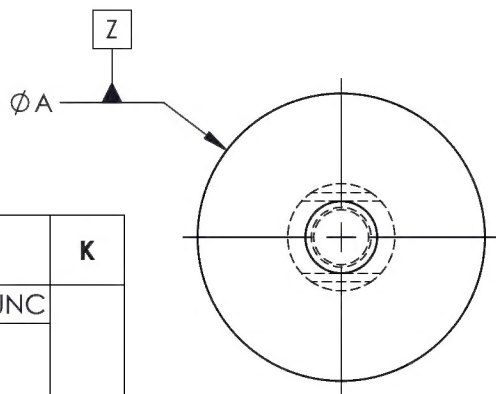
REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	JAG



USE FOR TOOLS RBST3000P THRU RBST3005P



TOOL NUMBER	ØA +.000 -.002	B +.010 -.010	C +.010 -.010	D +.000 -.005	E	F +.010 -.010	ØG +.000 -.008	ØH +.000 -.003	J	K
RBST3000P	.188	1.001	2.331	.083	#8-32 UNC	.300	.250	.190	#10-24 UNC	
RBST3001P	.188	1.110	2.440	.083	#8-32 UNC		.310			
RBST3002P	.248	1.100	2.475	.096	#10-24 UNC		.310			
RBST3003P	.248	1.100	2.475	.096	#10-24 UNC	.440	.310			
RBST3004P	.310	1.100	2.475				.338			
RBST3005P	.310	1.064	2.394				.338			
RBST3006P	.373	1.183	2.523			.423				.703
RBST3007P	.435	1.189	2.500							
RBST3008P	.435	1.189	2.500							
RBST3009P	.498	1.189	2.500							
RBST3010P	.498	1.189	2.500			.494	.250	1/4-20 UNC		
RBST3011P	.560	1.260	2.600							
RBST3012P	.560	1.331	2.664	.125	1/4-28 UNF					
RBST3013P	.623	1.295	2.628				N/A			.690
RBST3014P	.623	1.495	2.815							.659
RBST3015P	.748	1.589	2.878			.600				.703
RBST3016P	.743	1.250	2.590			.494				.695
RBST3017P	.873	1.506	2.831			.600				.703
RBST3018P	.873	1.550	2.883			.600				.680
RBST3019P	.998	1.735	3.045			.900				.596
RBST3020P	.998	2.027	3.253			.900				



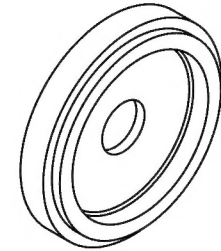
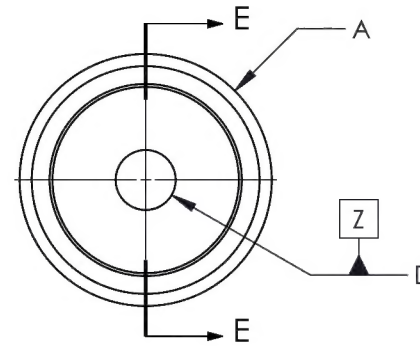
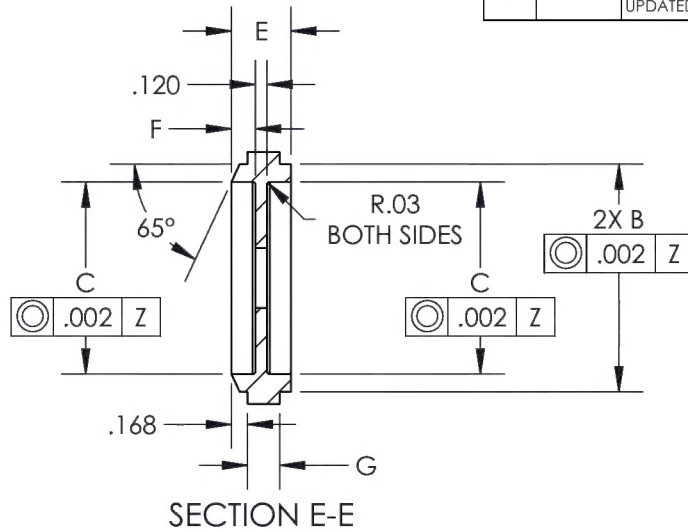
USE FOR TOOLS RBST3006P THRU RBST3020P

⑨
STUD

DART AEROSPACE			
TITLE		RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO.		SEE TABLE-9	
MAT'L		4140 Q&T/4142 Q&T	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		APPROVED	
.XXX ± .005		FRACTIONS ± 1/8	
.XX ± .01		ANGLES ± 5°	
.X ± .1		FINISH	
1. BREAK ALL SHARP EDGES .015 x 45°		SPEC	
OR .015R		USED ON MODEL	
2. DIMENSIONAL LIMITS APPLY AFTER PLATING		SEE TABLE	
SCALE		DATE	
3:2		SHEET 6 OF 9	

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	JAG



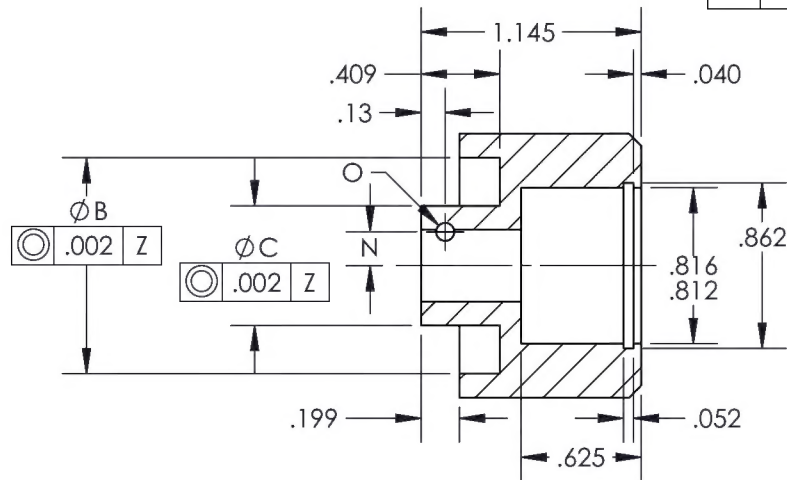
TOOL NUMBER	Ø A +.010 -.020	Ø B +.000 -.003	Ø C +.002 -.000	Ø D +.003 -.000	E	F	G					
RBST3000P	1.25	0.998	0.5	0.48	0.500	0.125	0.215					
RBST3001P			0.542									
RBST3002P												
RBST3003P												
RBST3004P												
RBST3005P			0.66									
RBST3007P	1.375	1.122	0.806	0.625	0.620	0.250	0.335					
RBST3008P			0.837									
RBST3009P			0.876									
RBST3010P			0.9									
RBST3011P	1.5	1.247	0.97					0.500	0.160	0.215		
RBST3012P			1.025									
RBST3013P	1.563	1.31	1.063	0.620	0.250	0.335						
RBST3014P			1.087									
RBST3015P	1.75	1.447	1.251				0.620				0.250	0.335
RBST3016P	1.875	1.622	1.313									
RBST3017P	2	1.747	1.438					0.620	0.250	0.335		
RBST3018P	2.125	1.872	1.501									
RBST3019P	2.25	1.997	1.626									
RBST3020P	2.625	2.372	2.001									

(-11)
DUAL SEAT

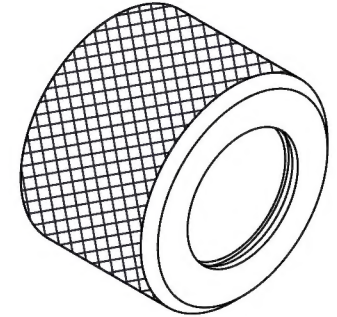
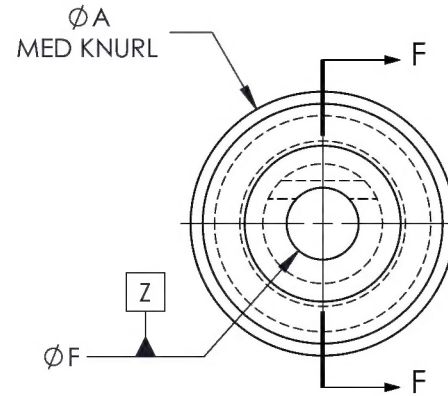
DART AEROSPACE	
TITLE RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO. SEE TABLE-11	REV 8
MAT'L 4140 Q&T/4142 Q&T	DRAWN BY:
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVED <i>J Gilbert</i>
.XXX ± .005 FRACTIONS ± 1/8	HEAT TREAT
.XX ± .01 ANGLES ± 5°	FINISH BLACK OXIDE
.X ± .1	SPEC
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	USED ON MODEL
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	SEE TABLE
SCALE 1:2	DATE
SHEET 7 OF 9	

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	



SECTION F-F



TOOL NUMBER	Ø A +.010 -.010	Ø B +.003 -.000	Ø C +.000 -.003	Ø F +.002 -.000	N +.003 -.003	O +.003 -.000				
RBST3000P	1.25	1	0.478	0.19	0.118	0.062				
RBST3001P			0.54							
RBST3002P				0.25	0.133					
RBST3003P										
RBST3004P										
RBST3005P							0.313	0.162		
RBST3007P	1.375	1.125	0.623	0.375	0.176	0.094				
RBST3008P										
RBST3009P										
RBST3010P										
RBST3011P	1.5	1.196								
RBST3012P		1.25								
RBST3013P	1.563	1.313								
RBST3014P										
RBST3015P	1.75	1.5								
RBST3016P	1.875	1.625								
RBST3017P	2	1.75								
RBST3018P	2.125	1.875								
RBST3019P	2.25	2								
RBST3020P	2.625	2.375								

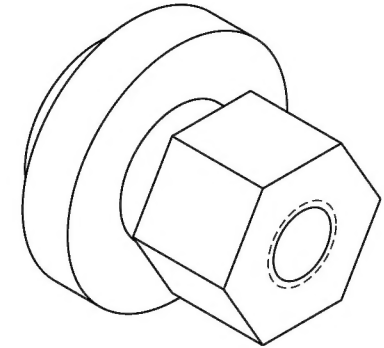
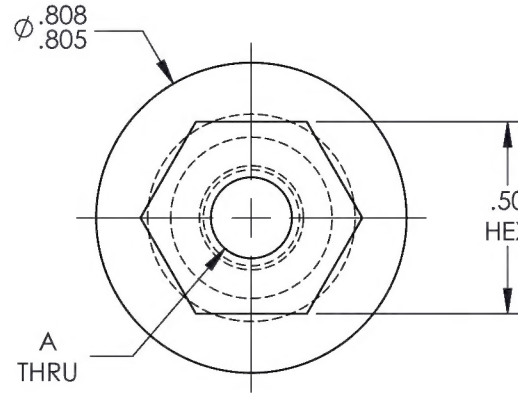
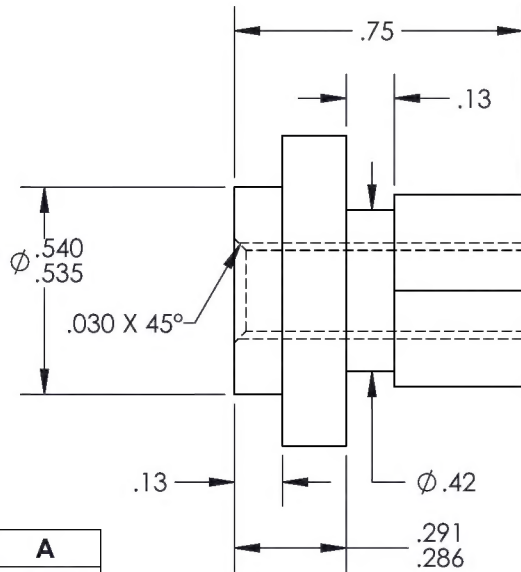
(-13)

RECEIVER

DART AEROSPACE	
TITLE RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO.	SEE TABLE-13
REV 8	
MAT'L 4140 Q&T/4142 Q&T	DRAWN BY:
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVED <i>J Gilbert</i>
.XXX ± .005 FRACTIONS ± 1/8	HEAT TREAT
.XX ± .01 ANGLES ± 5°	FINISH BLACK OXIDE
.X ± .1	SPEC
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	USED ON MODEL
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	SEE TABLE
SCALE 1:1	DATE
SHEET 8 OF 9	

This drawing, specifications, and concepts contained here in are the sole property of Dart Aerospace, and may not be reproduced or used in any fashion without the prior written permission of Dart Aerospace Eugene, OR.

REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
8		COMBINED DWGS RBST300P THRU 3006P & RBST3006P THRU 3020P. CHG T/N TO -P FROM P. UPDATED TO NEW DRAFTING STANDARDS.	7/14/2015	SM	



TOOL NUMBER	A
RBST3000P	#8-32
RBST3001P	#8-32
RBST3002P	#10-24
RBST3003P	#10-24
RBST3004P	1/4-28
RBST3005P	1/4-28
RBST3007P	1/4-28
RBST3008P	1/4-28
RBST3009P	1/4-28
RBST3010P	1/4-28
RBST3011P	1/4-28
RBST3012P	1/4-28
RBST3013P	1/4-28
RBST3014P	1/4-28
RBST3015P	1/4-28
RBST3016P	1/4-28
RBST3017P	1/4-28
RBST3018P	1/4-28
RBST3019P	1/4-28
RBST3020P	1/4-28

(-15)

TESIONER

DART AEROSPACE	
TITLE RBST3000-P THRU 3020-P PORTABLE TRI-ROLLER SWAGING TOOL	
DWG NO. SEE TABLE-15	REV 8
MAT'L 4140 Q&T/4142 Q&T	DRAWN BY:
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVED <i>J Gilbert</i>
.XXX ± .005 FRACTIONS ± 1/8	HEAT TREAT
.XX ± .01 ANGLES ± 5°	FINISH BLACK OXIDE
.X ± .1	SPEC
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	USED ON MODEL
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	SEE TABLE
SCALE 2:1	DATE
SHEET 9 OF 9	